

Appendix A

Claim Amendments

- 1. (Currently amended) A process for preparing an optically inhibitor (PPI) having a proton pump sulfinyl pure structure selected from the group consisting of 5-methoxy-2-[(4-methoxy-3,5-dimethyl-2-pyridinyl)methylsulphinyl]-1Hbenzimidazole, (S)-5-methoxy-2-[(4-methoxy-3,5-dimethyl-2-pyridinyl) methylsulphinyl]-1H-benzimidazole, difluoromethoxy-2-[(3,4-dimethoxy-2pyridinyl) methylsulphinyl] -1H-benzimidazole, 2-[3-methyl-4-(2,2,2-trifluoroethoxy) -2-pyridinyl) methylsulphinyl] -1Hbenzimidazole, 2-{[4-[3-methoxypropoxy)-3-methylpyridin-2yl]methylsulphinyl}-1H-benzimidazole, and 5-methoxy-2-((4methoxy-3,5-dimethyl-2-pyridylmethyl)sulphinyl}-1H-imidazo-(4,5-b)pyridine in enantiomerically pure enantiomerically enriched form comprising oxidizing corresponding sulfide of said PPI, wherein the oxidation is carried out in the presence of a chiral zirconium complex or a chiral hafnium complex.
- 2. (Currently amended) A process for preparing an optically pure PPI having a sulfinyl structure selected from the group consisting of 5-methoxy-2-[(4-methoxy-3,5-dimethyl-

2-pyridinyl) methylsulphinyl]-1H-benzimidazole, (S)-5methoxy-2-[(4-methoxy-3,5-dimethyl2-pyridinyl) methylsulphinyl]-1H-benzimidazole, 5difluoromethoxy-2-[(3,4-dimethoxy-2pyridinyl) methylsulphinyl]-1H-benzimidazole, 2-[3-methyl-4(2,2,2-trifluoroethoxy)-2-pyridinyl) methylsulphinyl]-1Hbenzimidazole, 2-{[4-[3-methoxypropoxy)-3-methylpyridin-2yl]methylsulphinyl}-1H-benzimidazole, and 5-methoxy-2-((4-

- methoxy-3,5-dimethyl-2-pyridylmethyl)sulphinyl}-1H-imidazo- (4,5-b)pyridine, in enantiomerically pure or enantiomerically enriched form comprising oxidizing a corresponding sulfide of said proton pump inhibitor (PPI) wherein the oxidation is carried out in the presence of a chiral zirconium complex.
- 3. (Previously presented) The process according to Claim 1, wherein the optically pure PPI having a sulfinyl structure is obtained in an optical purity of > 90%.
- 4. (Previously presented) The process according to Claim 1, wherein the oxidation is carried out using cumene hydroperoxide.

- 5. (Previously presented) The process according to Claim 1, wherein the chiral zirconium complex is selected from the zirconium(IV) acetylacetonate, consisting of butoxide, tert-butoxide, zirconium(IV) zirconium(IV) zirconium(IV) ethoxide, zirconium(IV) n-propoxide, isopropoxide zirconium(IV) and zirconium(IV) isopropoxide/isopropanol, and wherein the chiral hafnium selected from the group consisting complex is acetylacetonate, hafnium(IV) butoxide, hafnium(IV) hafnium(IV) tert-butoxide, hafnium(IV) hafnium(IV) n-propoxide, hafnium(IV) isopropoxide hafnium(IV) isopropoxide/isopropanol.
- 6. (Previously presented) The process according to Claim 2, wherein the chiral zirconium complex is selected from the consisting of zirconium(IV) acetylacetonate, group zirconium(IV) butoxide, zirconium(IV) tert-butoxide, ethoxide, zirconium(IV) zirconium(IV) n-propoxide, isopropoxide zirconium(IV) zirconium(IV) and isopropoxide/isopropanol.

7- 9. (Canceled)

- 10. (Previously presented) The process according to Claim
- 1, wherein the oxidation is carried out in the presence of an organic base.
- 11. (Previously presented) The process according to Claim
- 1, wherein the oxidation is carried out in the presence of a tertiary amine.
- 12. (Previously presented) The process according to Claim
- 1, wherein the oxidation is carried out in an organic solvent.
- 13. (Previously presented) The process according to Claim
- 1, wherein the oxidation is carried out in an organic solvent comprising 0 to 0.3% by volume of water.
- 14. (Previously presented) The process according to Claim
- 1, wherein the oxidation is carried out in an organic solvent which comprises methyl isobutyl ketone.
- 15-17. (Canceled)

18. (Currently Amended) The process according to Claim 1, wherein the optically pure PPI prepared by the process is selected from the group consisting of (S)-5-methoxy-2-[(4methoxy-3,5-dimethyl-2-pyridinyl)methylsulphinyl]-1Hbenzimidazole, (S) 5-difluoromethoxy 2-[(3,4-dimethoxy-2pyridinyl) methylsulphinyl] 1H benzimidazole, (S) -2-[3methyl-4-(2,2,2-trifluoroethoxy)-2-pyridinyl)methylsulphinyl]-1H-benzimidazole, (S)-2-{[4-[3-methoxypropoxy)-3-methylpyridin-2-yl]methylsulphinyl}-1H-benzimidazole, (S) -5-methoxy-2-((4-methoxy-3,5-dimethyl-2pyridylmethyl)sulphinyl/}-1H-imidazo(4,5-b)pyridine, (R)-5methoxy-2-[(4-methoxy-3,5-dimethyl-2pyridinyl) methylsulphinyl] -1H-benzimidazole, (R) - 5 difluoromethoxy-2-[(3,4-dimethoxy-2pyridinyl) methylsulphinyl] -1H-benzimidazole, (R) - 2 - [3 methyl-4-(2,2,2-trifluoroethoxy)-2pyridinyl) methylsulphinyl] -1H-benzimidazole, (R) -2-{ (4-(3methoxypropoxy) -3-methylpyridin-2-yl) methylsulphinyl}-1Hbenzimidazole and (R)-5-methoxy-2-((4-methoxy-3,5-dimethyl-2-pyridylmethyl)sulphinyl)-1H-imidazol(4,5-b)pyridine.

19-21. (Canceled)

(Currently Amended) An optically pure PPI prepared by 22. the process according to claim 1 selected from the group (S) -5-methoxy-2-[(4-methoxy-3,5-dimethyl-2consisting of pyridinyl) methylsulphinyl] -1H-benzimidazole, (S) 5 difluoromethoxy 2 [(3,4 dimethoxy 2 pyridinyl) methylsulphinyl] 1H-benzimidazole, (S)-2-[3-methyl-4-(2,2,2trifluoroethoxy) -2-pyridinyl) methylsulphinyl] -1H- $(S) -2 - \{ [4 - (3 - methoxypropoxy) - 3 - methyl - (3 - methyl - methyl$ benzimidazole, pyridin-2-yl]methylsulphinyl}-1H-benzimidazole (S)-5or methoxy-2-((4-methoxy-3,5-dimethyl-2-pyridylmethyl)sulphinyl)-1H-imidazo[4,5-b]pyridine, (R)-5-methoxy-2-[(4-methoxy-3,5-dimethyl-2-pyridinyl)methylsulphinyl]-1Hbenzimidazole, (R)-5-difluoromethoxy-2-[(3,4-dimethoxy-2pyridinyl) methylsulphinyl] -1H-benzimidazole, (R) - 2 - [3 methyl-4-(2,2,2-trifluoroethoxy)-2pyridinyl) methylsulphinyl]-1H-benzimidazole, (R)-2-{[4-(3methoxypropoxy) -3-methylpyridin-2-yl]methylsulphinyl}-1Hbenzimidazole and (R)-5-methoxy-2-((4-methoxy-3,5-dimethyl-2-pyridylmethyl)sulphinyl)-1H-imidazo[4,5-b]pyridine.

23. (Previously presented) The process according to Claim 1, wherein the oxidation is carried out in the presence of a chiral auxiliary.

- 24. (Previously presented) The process according to Claim 23, wherein the chiral auxiliary is a chiral tartaric acid derivative.
- (Previously presented) The process according to Claim 25. 23, wherein the chiral auxiliary is selected from the group consisting of (+)-L-tartaric acid bis-(N,N-diallylamide), (+)-L-tartaric acid bis-(N,N-dibenzylamide), (+)-L-tartaric acid bis-(N,N-diisopropylamide), (+)-L-tartaric acid bis-(N, N-dimethylamide), (+)-L-tartaric acid bis-(Npyrrolidinamide), (+)-L-tartaric acid bis-(Npiperidinamide), (+)-L-tartaric acid bis-(Nmorpholinamide), (+)-L-tartaric acid bis-(Ncycloheptylamide), (+)-L-tartaric acid bis-(N-4-methyl-Npiperazinamide), dibutyl (+)-L-tartrate, di-tert-butyl (+)-L-tartrate, diisopropyl (+)-L-tartrate, dimethyl (+)-Ltartrate, diethyl (+)-L-tartrate, (-)-D-tartaric acid bis-(N, N-diallylamide), (-)-D-tartaric acid bis-(N,Ndibenzylamide), (-)-D-tartaric acid bis-(N,N-acid bis-(N,Ndimethylamide), (-)-D-tartaric acid bis-(N-pyrrolidinamide, (-)-D-tartaric acid bis-(N-piperidinamide), (-)-D-tartaric

acid bis-(N-morpholinamide), (-)-D-tartaric acid bis-(N-cycloheptylamide), (-)-D-tartaric acid bis-(N-4-methyl-N-piperazinamide), dibutyl (-)-D-tartrate, di-tert-butyl (-)-D-tartrate, diisopropyl (-)-D-tartrate, dimethyl (-)-D-tartrate and diethyl (-)-D-tartrate.

- 26. (Previously presented) The process according to Claim 23, wherein the chiral auxiliary is selected from the group consisting of (+)-L-tartaric acid bis-(N,N-dimethylamide), (+)-L-tartaric acid bis-(N-pyrrolidinamide), (+)-L-tartaric acid bis-(N-morpholinamide), (-)-D-tartaric acid bis-(N,N-dimethylamide), (-)-D-tartaric acid bis-(N-pyrrolidinamide) or (-)-D-tartaric acid bis-(N-morpholinamide).
- 27. (Previously presented) The process according to Claim 23, wherein the chiral zirconium complex is selected from the group consisting of zirconium(IV) acetylacetonate, zirconium(IV) butoxide, zirconium(IV) tert-butoxide, ethoxide, zirconium(IV) zirconium(IV) n-propoxide, zirconium(IV) isopropoxide, zirconium(IV) and isopropoxide/isopropanol, and wherein the chiral auxiliary is selected from the group consisting of (+)-L-tartaric acid bis-(N,N-diallylamide), (+)-L-tartaric acid bis-(N,N-

dibenzylamide),	(+)-L-tartaric	acid	bis-(N,N-
diisopropylamide),	(+)-L-tartaric	acid	bis-(N,N-
dimethylamide),	(+)-L-tartaric	acid	bis-(N-
pyrrolidinamide),	(+)-L-tartaric	acid	bis-(N-
piperidinamide),	(+)-L-tartaric	acid	bis-(N-
morpholinamide),	(+)-L-tartaric	acid	bis-(N-
cycloheptylamide),	(+)-L-tartaric acid	bis-(N-	4-methyl-N-
piperazinamide), dik	outyl (+)-L-tartrate,	di-tert-	-butyl (+)-
L-tartrate, diisopr	copyl (+)-L-tartrate	e, dimeth	nyl (+)-L-
tartrate, diethyl (+)-L-tartrate, (-)-D-tartaric acid bis-			
(N,N-diallylamide),	(-)-D-tartaric	acid	bis-(N,N-
dibenzylamide),	(-)-D-tartaric	acid	bis-(N,N-
diisopropylamide),	(-)-D-tartaric	acid	bis-(N,N-
dimethylamide),	(-)-D-tartaric	acid	bis-(N-
pyrrolidinamide),	(-)-D-tartaric	acid	bis-(N-
piperidinamide),	(-)-D-tartaric	acid	bis-(N-
morpholinamide),	(-)-D-tartaric	acid	bis-(N-
cycloheptylamide),	(-)-D-tartaric acid	bis-(N-	4-methyl-N-
piperazinamide), dibutyl (-)-D-tartrate, di-tert-butyl (-)-			
D-tartrate, diisopropyl (-)-D-tartrate, dimethyl (-)-D-			
tartrate and diethyl (-)-D-tartrate.			

(Previously presented) The process according to Claim 28. 23, wherein the chiral zirconium complex is selected from group consisting of zirconium(IV) acetylacetonate, the butoxide, zirconium(IV) zirconium(IV) tert-butoxide, zirconium(IV) ethoxide, zirconium(IV) n-propoxide, isopropoxide, zirconium(IV) zirconium(IV) or isopropoxide/isopropanol complex, wherein the chiral auxiliary is selected from the group consisting of (+)-Ltartaric acid bis-(N,N-diallylamide), (+)-L-tartaric acid bis-(N,N-dibenzylamide), (+)-L-tartaric acid bis-(N,Ndiisopropylamide), (+)-L-tartaric acid bis-(N,Ndimethylamide), (+)-L-tartaric acid bis-(Npyrrolidinamide), (+)-L-tartaric bis-(Nacid piperidinamide), (+)-L-tartaric bis-(Nacid (+)-L-tartaric morpholinamide), acid bis-(Ncycloheptylamide), (+)-L-tartaric acid bis-(N-4-methyl-Npiperazinamide), dibutyl (+)-L-tartrate, di-tert-butyl (+)-L-tartrate, diisopropyl (+)-L-tartrate, dimethyl (+)-Ltartrate, diethyl (+)-L-tartrate, (-)-D-tartaric acid bis-(N, N-diallylamide), (-)-D-tartaric acid bis-(N,Ndibenzylamide), (-)-D-tartaric acid bis-(N,Ndiisopropylamide), (-)-D-tartaric acid bis-(N,Ndimethylamide), (-)-D-tartaric acid bis-(N-

acid pyrrolidinamide), (-)-D-tartaric bis-(Npiperidinamide), (-)-D-tartaric acid bis-(N-(-)-D-tartaric bis-(Nmorpholinamide), acid cycloheptylamide), (-)-D-tartaric acid bis-(N-4-methyl-Npiperazinamide), dibutyl (-)-D-tartrate, di-tert-butyl (-)-D-tartrate, diisopropyl (-)-D-tartrate, dimethyl (-)-Ddiethyl (-)-D-tartrate, and wherein the tartrate and oxidation is carried out in the presence of an organic base.

- 29. (Previously presented) The process according to Claim 23, wherein the chiral auxiliary is selected from the group consisting of (+)-L-tartaric acid bis-(N,N-dimethylamide), (+)-L-tartaric acid bis-(N-pyrrolidinamide), (+)-L-tartaric acid bis-(N-morpholinamide, (-)-D-tartaric acid bis-(N,N-dimethylamide), (-)-D-tartaric acid bis-(N-pyrrolidinamide) and (-)-D-tartaric acid bis-(N-morpholinamide), and wherein the oxidation is carried out in the presence of an organic base.
- 30. (Previously presented) The process according to Claim 23, wherein the chiral auxiliary is selected from the group consisting of (-)-D-tartaric acid bis-(N,N-dimethylamide),

- (-)-D-tartaric acid bis-(N-pyrrolidinamide) and (-)-D-tartaric acid bis-(N-morpholinamide), and wherein the optically pure PPI prepared by the process is (+)-pantoprazole.
- 31. (Currently Amended) The process according to Claim 23, wherein the chiral zirconium complex is selected from the of is zirconium(IV) group consisting n-propoxide, zirconium(IV) isopropoxide zirconium(IV) orisopropoxide/isopropanol complex, wherein the auxiliary is selected from the group consisting of (+)-Ltartaric acid bis-(N,N-dimethylamide), (+)-L-tartaric acid bis-(N-pyrrolidinamide) and (+)-L-tartaric acid bis-(Nmorpholinamide), wherein the oxidation is carried out using cumene hydroperoxide, and wherein the optically pure PPI prepared by the process is () pantoprazole.
- 32. (Currently Amended) The process according to Claim 23, wherein the chiral zirconium complex is selected from the group consisting of zirconium(IV) n-propoxide, zirconium(IV) isopropoxide and zirconium(IV) isopropoxide/isopropanol complex, wherein the chiral auxiliary is selected from the group consisting of (+)-L-

tartaric acid bis-(N,N-dimethylamide), (+)-L-tartaric acid bis-(N-pyrrolidinamide) or (+)-L-tartaric acid bis-(N-morpholinamide), wherein the oxidation is carried out using cumene hydroperoxide in the presence of a tertiary amine, and wherein the optically pure-PPI prepared by the process is (-)-pantoprazole.

33. (New) A process for preparing an optically pure proton pump inhibitor (PPI) having a sulfinyl structure selected from the group consisting of 5-methoxy-2-[(4-methoxy-3,5dimethyl-2-pyridinyl) methylsulphinyl]-1H-benzimidazole, (S) -5-methoxy-2-[(4-methoxy-3,5-dimethyl-2-pyridinyl) methylsulphinyl]-1H-benzimidazole, 2-[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridinyl)methylsulphinyl]-1Hbenzimidazole, 2-{[4-[3-methoxypropoxy]-3-methylpyridin-2yl]methylsulphinyl}-1H-benzimidazole, and 5-methoxy-2-((4methoxy-3,5-dimethyl-2-pyridylmethyl)sulphinyl}-1H-imidazo-(4,5-b)pyridine enantiomerically in pure orenantiomerically enriched form comprising oxidizing corresponding sulfide of said PPI, wherein the oxidation is carried out in the presence of a chiral zirconium complex

or a chiral hafnium complex.

- 34. (New) The process according to claim 33, wherein the optically pure proton pump inhibitor (PPI) having a sulfinyl structure is 5-methoxy-2-[(4-methoxy-3,5-dimethyl-2-pyridinyl)methylsulphinyl]-1H-benzimidazole.
- 35. (New) The process according to claim 33, wherein the optically pure proton pump inhibitor (PPI) having a sulfinyl structure is (S)-5-methoxy-2-[(4-methoxy-3,5-dimethyl-2-pyridinyl)methylsulphinyl]-1H-benzimidazole.
- 36. (New) The process according to claim 33, wherein the optically pure proton pump inhibitor (PPI) having a sulfinyl structure is 2-[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridinyl)methylsulphinyl]-1H-benzimidazole.
- 37. (New) The process according to claim 33, wherein the optically pure proton pump inhibitor (PPI) having a sulfinyl structure is 2-{[4-[3-methoxypropoxy)-3-methylpyridin-2-yl]methylsulphinyl}-1H-benzimidazole.
- 38. (New) The process according to claim 33, wherein the optically pure proton pump inhibitor (PPI) having a

sulfinyl structure is 5-methoxy-2-((4-methoxy-3,5-dimethyl2-pyridylmethyl)sulphinyl/}-1H-imidazo(4,5-b)pyridine.